POPULAR

Computing

WEEKLY

26 August 1982 Vol 1 No 19

35p

Pegasus

Spectrum sound box

Vic music maker

Idiot proof programs

Spectrum fastables



HOBHOUSE COURT, 19 WHITCOMB STREET WC2

WHY NOT TAKE OUT A SUBSCRIPTION?

You can have *Popular Computing Weekly* sent to your home for £19.95 a year This will cover the cost of the magazine, postage and packing

Fill in the coupon below and keep yourself up to date week by week

I would like to take out .... subscription(s) to *Popular Computing Weekly*

Name ....

Address ....

....

....

Tel No ....

I enclose £ .... for .... subscription(s)

Please make cheques payable to Sunshine Publications Ltd

POPULAR Computing WEEKLY

The Team

Editor
Brendon Gore

Reporter
David Kelly [01-930 3271]

Sub-editor
Peter Harvey

Editorial Secretary
Fiona McCormick

Advertisement Manager
David Lake [01-839 2846]

Advertisement Executive
Alastair Macintosh [01-930 3840]

Managing Editor
Duncan Scot

Publishing Directors
Jenny Ireland
Nick Hampshire

Popular Computing Weekly
Hobhouse Court 19 Whitcomb Street,
London WC2
Telephone 01-839 6835

Published by Sunshine Publications Ltd

Typesetting, origination and printing by Chesham Press Chesham, Bucks

Distributed by S M Distribution
London SW9 01-274 8611 Telex 261643

Subscriptions
You can have *Popular Computing Weekly* sent to your home the subscription rate is £16 95 per year for addresses in the UK £37 40 overseas

How to submit articles
Articles which are submitted for publication should not be more than 1000 words long

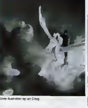
All submissions should be typed and a double space should be left between each line

Programs should whenever possible be computer printed

At present we cannot guarantee to return every submitted article, so please keep a copy

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week



Cover illustration by Ian Craig

Editorial

Prospective Spectrum buyers will undoubtedly know that there have been some considerable delays in delivering the machine Delays of 10, 12 or even 15 weeks have been reported

This is admittedly a different order of magnitude to the BBC saga where delays of six or nine months have been all too common But, even delays of 10 weeks are still too long

Sinclair claim to have solved their production problems and are confident that they will have cleared their backlog of orders by the end of September This may be somewhat optimistic, but it does look as though Sinclair will be producing Spectrums in quantity by the beginning of September

Sinclair are also writing to all their customers who have ordered Spectrums, telling them the position and offering refunds to anyone who feels dissatisfied In addition, those people who have been waiting for their Spectrums will receive a £10 voucher

This is a welcome change in Sinclair policy People who are kept waiting for their micros do not object half as much if they know why they are being kept waiting It is being fobbed off with unexplained "production difficulties" that really upsets people

Next Week





Trapped in the deeps . . . can you survive Under Pressure — a new game for Spectrum

Atari declares copyright war on Pac-Man rivals

by David Kelly

ATARI has fired the opening shots in what promises to be a copyright war with far-reaching implications.

Commodore has been the first to feel the effects but other companies, including Bug-Byte, A and F Software and Micropower are also involved.

Graham Daubney, Atari's software manager, would not comment on his company's actions but issued the following official statement.

"Atari International (UK) Inc is at present campaigning against video games which infringe the *Pac-Man* copyright. The campaign is being pursued to protect the customer against imitations.

"As part of the campaign, Atari is applying for an injunction against Commodore Business Machines (UK) Ltd, *Jellymonsters*.

"Atari allege that *Jellymonsters* is an infringement of their copyright. Atari are pressing for a full hearing as soon as possible and will claim substantial damages."

Atari's campaign is being conducted on two fronts.

Both the Commodore and Bug-Byte actions concern Vic-20 cassettes. In each case the companies have been instructed to stop sale of the tapes, to surrender all remaining stocks and promotional material to Atari, to pay Atari all revenue gained through their sale and to allow Atari access to their business records.

Commodore is not prepared to comment on the situation at present. A spokesman for the company would only say "We are aware of the Atari claim."

Bug-Byte, however, has agreed to abide by the first two of Atari's instructions. It has stopped all sale of its *Vic-Men* program and has surrendered all remaining stocks and promotional material to Atari.

"We had the choice of doing what we did or getting involved in a very expensive legal battle that could have cost tens of thousands of pounds," said Bug-Byte's managing director, Tony Baden.

"We do not agree that they have got copyright except on the *Pac-Man* program listing — and all our listings are completely different," he told *Popular Computing Weekly*.

"There is no way that we can afford to stand up against a company the size of Atari, but it obviously needs something like this to go to court to sort out the position.

"In the long term I suppose it will be good for the industry. The arcade situation is becoming stale at the moment and it will force companies to think up original games.

"Atari's action has not affected us at all. Admittedly *Vic-Men* was one of our most successful games but we will survive."

In the other series of moves A and F Software and Micropower have received instructions to send copies of certain programs to Atari for inspection.

Mike Fitzgerald, managing director of A and F Software explained "The letter from Atari requested us to send them a copy of our *Polecat* program for the Acorn Atom to look at and play. If they decided that the program is not an infringement then Atari would send us the recommended retail price of the cassette.

"We have no intention of sending them a copy of *Polecat*. It does not, in our view, infringe the Atari copyright. If Atari wish, they are quite welcome to call and we will demonstrate the program.

Offending the big guns of Atari Bugbyte's Vic-Men

"Whatever happens, we are not removing our program *Polecat* from the market and it will need a court order for us to do so.

"A and F fully intend to go ahead and develop the *Polecat* program for any computer we choose.

"We believe that the program does not infringe Atari copyright either in machine-code or visual image."

Micropower has now received three letters similar to that received by A and F, relating not only to alleged infringements of the *Pac-man* copyrights but also that of another Atari game, *Centipede*. Managing director, Bob Simpson, said "It is unlikely that we shall be supplying copies of any of our games. We have over 150 games on sale and if we start sending out tapes in this way, where will it all end?

"There is no doubt, though, that any injunction taken out against us would be quite damaging, bearing in mind that the average life of a computer game is at most three or four months."

Video module for Microtan

THE Video 80/82 is a new Microtan add-on produced by the Tangerine Users Group.

The unit handles the video display, thereby freeing the host microcomputer for other tasks.

With the addition of the Video 80/82, which incorporates its own 16K Ram and 6502E processor, 80 character lines and ultra hi-resolution graphics can be created.

Out in front

Bob Green of the Tangerine Users Group explained "It is one of the biggest projects we have undertaken and it will put the Microtan well out in front of its competition."

The Video 80/82 will be priced at around £200.



The new Merlin integrated system launched this week

Merlin micro system launched

A NEW low-priced business micro system is launched this week.

The Z80-based Merlin will cost in the region of £1500 and will run TRS80 software.

It has 64K Ram, twin floppy discs, a 63 × 16 display and incorporates a full-size keyboard with separate numeric pad and high-contrast monitor.

Extras include a CP/M® operating system, RS232 interface, hard discs, dot-addressable hi-resolution graphics board and networking.

More information is available from C T Maddison Ltd, Eagle Industrial Estate, The Crofts, Witney, Oxford.

The NewBrain goes global

GRUNDY Business Systems has signed a distributorship agreement to export NewBrain microcomputers to France.

The Paris-based company Sanocor International, is to handle the NewBrain's French sales.

Initially, Grundy will export 300 of the machines fitted with French keyboards and UHF tv modulators.

Andy Surtees, Grundy's Marketing Manager, said "We have similar dealership plans for the rest of Europe and the USA."

It is planned to step up the French exports to 200 per week. This figure represents 40 per cent of the current NewBrain output.

Cut price ZX81s hit the High St

SINCLAIR Research is to sell its ZX81 microcomputer through an increased range of high street outlets

This announcement follows last week's cut in the price of the micro to under £50

In this new move, selected branches of Boots and Greens (a subsidiary of Debenhams) will begin selling the ZX81 and associated product range at the end of August

Sinclair Research has also appointed a wholesaler, Prism Microproducts to distribute the range to smaller retail companies

A Sinclair spokesman commented that the retail expansion represented a "mature second phase in the marketing of the machine as a household item"

Bob Denton, managing director of the newly-appointed wholesaler said "There is now spare ZX81 production capacity We think that the £20 price cut will open up a new stratum of the market Initially we have contacted over 1000 established micro suppliers but we shall soon be looking at toy shops, newsagents and video rental shops"

Prism Microproducts is a sister company of ECC Publications who produce the magazine *Sinclair User*

A fair Autumn is assured!

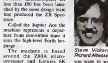
A SURFEIT of micro shows is planned for the second weekend in September

The 5th annual *Personal Computer World* show will be held in the new Barbican Centre, London from September 9 to 12 Entry is £2.50 and the show will be open from 10 am to 7 pm from Thursday to Saturday, and from 10 am to 5 pm on Sunday

Microscene Brum '82, catering mainly for the Sinclair user, will be held at the Bingley Hall Exhibition Centre, Birmingham, on September 11 The show will feature many Midlands companies and will be open from 10 30 am to 7 pm

By Jupiter, it's a Forthcoming micro attraction!

Spectrum team deal their Ace



Steve Vickers (left) and Richard Altwasser (right)

A NEW microcomputer for less than £90 has been launched by the same design team that produced the ZX Spectrum

Called the Jupiter Ace the machine represents a departure from convention since it runs the high-level Forth language

The machine is based around the Z80A microprocessor and features 8K Rom, 3K Ram 32 × 24 display output sound and full-size moving keyboard

The launch follows considerable speculation concerning the activities of the two designers, Richard Altwasser and Steve Vickers, following their departure from Sinclair in April this year

The Jupiter Ace, at £89 95, is the first low-priced micro to use the Forth language

"We chose Forth in preference to Basic," says Richard Altwasser, "because of its speed and flexibility

"It is a very compact language and memory goes much further In Forth you can define your own functions and tailor your program exactly to your needs — that's why it is so exciting

"Basic has a fixed set of functions and because of this they are made as unspecific as possible

"In Forth you can define new functions in terms of those that exist in the Rom or in terms of those you have already defined In this way you can extend the language in the direction of the program you want to write in a very concise way

"Forth is also so much faster — it is ten times faster than Basic"

Initially the machine will only be available in a 3K black-and-white version but there are plans for a 48K Ram expansion, colour board and printer interface The expansion and interface units should be available before Christmas

The Jupiter Ace will be manufactured close to where the two designers live in Bury St Edmunds, initially at a rate of 1000 per month

Richard Altwasser sees a broad market for the unconventional machine "It will be popular in the educational field because Forth is an easier language for children to learn," he said

"But it will also have appeal as a games machine because of its very high speed and because the language allows such sophisticated user-defined graphics"

The machine will be available in September by mail-order from Jupiter Cantab, 22 Foxhollow, Bar Hill, Cambridge

Acorn seeks to boost Beeb sales

ACORN will offer its dealers improved margins on the BBC machines in the next two or three months

The announcement of the improved offer — a reduction in cost of more than 10 percent — follows the decision of the Computer Retailers Association to fold its Acorn/BBC dealer group

At present the BBC models are sold to retailers at the full retail price

Until now the incentive for a dealer to stock the BBC range has been the normal profit margins on sales of the up-grade kit, printers and the new disc drives

Some retailers have also been combining the Model A machine with the up-grade kit to produce the Model B machine which is in short supply

Sounding off with a ZX81

ZON X-81 is a new sound effects add-on for the ZX81

Bi-Pak Semiconductors has produced the unit, based on a three-channel sound chip

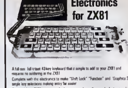
The attack/decay envelope of the three channels can be controlled using simple Basic statements from the ZX81 In this way the sound of a piano, organ or bell, helicopter or explosion can be simulated and added as part of a ZX81 program

Own speaker

The ZON X-81, pictured below, is self-contained, with its own loudspeaker and volume control

It costs £25.95 and is available from Bi-Pak Semiconductors 63a High Street, Ware, Herts (Tel 0920 3442/3182)





CLASSIFIED ADVERTISING RATES.

Line by line For private individuals 20p per word minimum 10 words
For companies traders and all commercial bodies 40p per word minimum 20 words
Semi-display £10 per single column centimetre minimum length 3 cm (Please supply A/W as PMT Or supply rough setting instructions)
Conditions All copy for Classified section must be pre-paid Cheques and postal orders should arrive at least two weeks before the publication date
If you wish to discuss your ad please ring Alastair Macintosh 01-930 3840

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

		Please continue on a separate sheet of paper	

I make this words at per word so I owe you £

Name

Address

Telephone

Please cut out and send this form to Classified Department *Popular Computing Weekly* Hobhouse Court 19 Whitcomb Street, London WC2

Classified

CUT-PRICE COMPANIONS

For still away the best
Your Computer magazine

THE ZX81 COMPANION by Bob Maunder is now available at ONLY £4.95 with a FREE SUPPLEMENT on the ZX Spectrum! This offer ends on 30 September so hurry!

LINSAC is and producing a SPECTRUM COMPANION series and the first one The Spectrum Games companion is available from October at £5.95

The above prices include UK postage. Send cheques to

LINSAC (PC)

68 Barrow Road Middlesbrough TS5 5ES

AT LAST!
SUPERB SPECTRUM SOFTWARE

All programs will run on 16K or 48K. 3D MAZE OF DEER — £5.95 a bizarre maze adventure with 3D maze graphics. LIFE — £4.95 and in m/c for two generations a sec. With screen editing. MUNCHMAN — £3.95 empty the maze! DEER ISLAND — £3.50 a new maze game. ZX-CESIL — £4.95 full implementation (also for 16K ZX81) with manual.

From: GILSOFT, 30 HAWTHORN ROAD, BARRY, S. GLAM. CF6 8LE. Tel. 0446-736369

16K ZX SPECTRUM m/c

Now available. Order now — BERSERK (£5.95) SPEC-MAN (£5.95) Jogo type 1 (BRIDGER and DEPTH CHARGE £5.50) Jogo type 2 (ALIEN BLASTER and SPACIOUS £5.50)

True arcade display, fast delivery and send only postage or postal orders payable to

AERO SOFTWARE, 27 HALLCROFT AVE., COUNTESTHORPE, LEICESTERSHIRE LE8 3RL

(SAE for ZX catalogue)

ZX SPECTRUM 16K — Fruit Machine Hold and Gamble features uses many advanced Spectrum facilities. Only £3.95 inclusive. Character Design Aid — Will design and save characters and allows manipulation of designed character — Rotate about three axis, invert, etc. Many example characters. Only £3.50. Supplied on quality cassette plus PLUS Printer listing. Cheques/POs to Soft Sell Computer Software 1 Waltington Street, Long Eaton Nottingham

VIC20. Also addition unit and 3K Ram £140 one. Tel 01-328 1122

GENIE 16K, £250. Many extras plus software and books. Tel 01-979 5816

SPECTRUM SOFTWARE. Breakout (full version) m/c utilities four way scrolling and rolling. Also 'fill' (fill screen with specified character attributes). Actually 18 individual routines! £4.00. Cheque or PO to P. Miles 195 Worcester Road Chichester Sussex.

ZX80 8K ROM. Seven good 1K programs on cassette include Space Read Adventure Digital Clock. Send £3.50 to 86 Qualitas Roman Hill Bracknell Berks

SPECTRUM VENTURE. An exciting adventure type game with colour and sound. Fantastic video effects add a new high standard in programming. 16K and 48K versions on one cassette. £8. Bobker, 29 Chadderton Drive Unsworth Bury

VIC20 and cassette unit and Vic Pre-vitalised and Joystick, £200. Tel Clitheroe 24516

ZX81 (16K) with Kempston keyboard and bleeper many good and cassettes, £50. Phone Langport 250580 (Tyson)

ZX USERS

Join the National ZX Users Club, and double the thrill of your ZX81, Spectrum or ZX80. Each month we publish the magazine INTERFACE which contains a mass of programs for each machine as well as members-only offers, hints, tips, contact addresses and more. We'll also help you with your hardware or programming problems. Join the country's largest users club. £1 gives you a sample copy of INTERFACE and full club details.

National ZX Users Club Dept PC, 44-46 Earls Court Road, LONDON W8 6EJ

CALLING ALL SINCLAIR ZX81 AND ATARI USERS!!!

How about sharing that program you've written? Total UK Distribution and high royalties. 25%!! on all programs sold! Programs should be cassette or type based business and games appreciated. Complete with running details.

Forward to

STUDGE AND WRIGHT SOFTWARE, 34 CRANBOURN STREET, LONDON WC2

ZX SPECTRUM SOFTWARE

SUPERDRAW £3 incl VAT P&P. Graphics design aid for 16K Spectrum. With slow wide option.

SUPERVIEW £5 inc VAT P&P. Personal viewdata system. Up to 46 pages on 48K Spectrum

Both programs need full Spectrum postage, enabled with illustrated and audio commentary on cassette

Weee Software Ltd, Weee Lodge, Kinver, Stourbridge W Midlands DY7 6BU

ONE ATARI CONSOLE and four games for £120. Contact 72 Wychood Avenue Knowle Solihull B93 9DQ

TI99/4A SOFTWARE on cassette, from £1 inc. SAE to ATL, 115 Crescent Drive South Brighton BN2 6SB

BBC MICRO MODEL B. Two weeks old only £385. Tel Cumbernauld 33142

ZX81 16K FD KEYBOARD CASED £40-worth software £78. Tel 0344 29320

BUSVIC-1 Six business packages programs for the Vic20 + printer Purchases Sales Send Account, etc. For the small business or self employed. Full explanatory booklet with cassette. Two telephone lines open for consultation. £16 all inclusive. John Probert, Studio Wootton Hall Wootton-Wawen Warwickshire. Tel Henley-in Arden 3457 and Stratford-upon-Avon 740588. State whether VAT or Non-VAT required.

VIC20 UNEXPANDED SOFTWARE Alien Shoot, Hammurabi, Hunt the Wumpus, Larger Smaller, Reaction, Russian Roulette £3.50. A. Winett, 1 Thornhill Road Surbiton Surrey

VIC GAMEX COMPENDIUM 1 Air-shoot Deathtrack Demolition, Target blast Execution Fishing Budgie Catch Dropstop Hamurabi Duck shoot. With great colour, sound and hi-res graphics, runs in 3.5K, only £6. From P. Hudson 43 Hillcrest Drive Beverley North Humberside

INVALUABLE NEW BBC SOFTWARE AID Saves time and learn how to shoot your own graphics in binary. Send £2.75 for comprehensive instructions including 24 characters (Aliens Pacman Cards etc) ready to enter into your own programmes. Javon Hood, 2 Honeybourne Close Oadby Leicester

---

PROGRAM GENERATORS

Ask yourself

"As a cost conscious user of a microcomputer how can you obtain application software easily, economically and efficiently to increase your productivity and create greater profits?"

The answer

Dynatech do it yourself program generators.

The key to efficiency and ease of use, productivity, cost saving and thus the ability to create greater profits. Even without experience you can write programs in minutes. Write now or phone for details.

DYNATECH MICROSOFTWARE LTD

Summerfield House, Vale, Guernsey, C.I. Telephone 0481 47377 Telex 4191130

BBC SOFTWARE
Educational and leisure programs

Space Academy 32K. Driving Test 32K. Snakes and Ladders 32K. England 32K. Bunnytrain 16K (for young children). Base for fun 16K (for young children). Programs £6 inc. Two for £6 inc. S.A.E. for details.

Sent by return of post with cheque/POs cleared, mail order only

SWIFT LINK SOFTWARE, 116-120 WARDOUR STREET W1V 4BT

VIC20 RENUMBER including gosubs etc plus user character designer £5.50. A. Collyer 141 Montserrat Road Basingstoke Hants.

VIC SCRAMBLE, 3K m/c, superb graphics £5.00. T Broadbent, 88 Birch Road HD4 7LP

BBC SOFTWARE — attend 8 Mutant Attack, Wild Walk, Earth Defence Auto Dodge Super Breakout, all five £4.50. A. Holmes. Fairway House, Ghyll Road, Crowborough Sussex.

VIC20 (UNEXPANDED). five super programs: Earth Invader, Hangman, Sub-Attack, Lunar Landing, Simon, £3.95. M Shah 3 Alwyn Drive Longsight, Manchester M13 0YF

ZX SPECTRUM SOFTWARE. Laser-blast Dodgem Blitzkrieg Fruit Machine Starship Breakout, £5 for two. Graphic Package Turtle-graphics L & R Scroll (Hires) and others £8. Send for list R. Rowlingson 16 Mapleton Road, Enfield Middx. EN1 3PE.

SPECTRUM DISASSEMBLER. All 696 Z80 instructions fully disassembled. Comes on cassette and Grafiks 1 for only £5.95. Send sae for details of more Spectrum software to Kevin Porter, 2 Grove Road, Redland, Bristol BS6 6UJ

ZX81 16K RAM plus 16K cassette and over 300 games, 1K–16K, including many books and mags, £100. Phone South Ockendon 867107

VIC20 PLUS 16K MEMORY, will use only £120 for quick sale. Penn Post Office, Llanbedr Gwynedd, LL45 2HH

VIC20, DATASETTE, 3K expansion. Rom National prog-ref guide. Vicmen Vic Asteroids. Vic Computing mags. £220! 0942-891109 evenings.

GRAPHIC ISLAND — ZX81. Pure graphics excitement, move from scene to scene instantly (in machine code) rescue the princess and collect enough gold to pay the boatman before the island crumbles into the sea

£3.95 for cassette and instructions for R. J. Yorke 9 Hillcrest Road, Thornton, Bradford, W Yorkshire

---

ATTENTION ALL MICRO USERS
Official Opening Saturday 4th September 1982
of the North-west's First Micro Computer Users Shop

MICRO—LINK

Covers S/ware for all popular Micros — BBC Atom, Spectrum ZX81 and Dragon 32 plus Hardware Ad-Ons

10 per cent off your first purchase with this advertisement, valid until 31st September

698 Hyde Road, Manchester M18 7JD. Tel 061-223 1094 (near Reddish Bridge, opposite Debdale Park)

A NEW RETAILER for Sinclair accessories in the North of England. We are situated near the M1 and M62 motorways. As well as a complete range of hard and software our service department can repair, modify or fit a wide range of accessories. Hours of business 10am — 8pm Monday to Saturday inclusive.

TELEPHONE PHILIP COPLEY ON Batley 273545 FOR FURTHER DETAILS.

ZX81 As new plus tape with Pac-man 3DMM Defender £50. Tel Belper 7752

VIDEO GENIE, plus Roxburgh (Star) printer and Centronics Interface 16K RAM upgraded 136k Rom. Word Processor books, tapes etc £325. Phone 01-653 0196

16K ZX SPECTRUM TO ZX80/81 ADAPTOR. Use your existing 16K RAM pack (even Sinclair's) to give 32K. Don't throw away your peripherals, make use of existing ZX81 add-ons. Only £7 (built) from Stephen Adams, 1 Leswin Road London N16 7NL.

ZX81 16K cassette. Nightmare Park, Nibblers Brands Zombies Galactic War Tank, Dambusters — over 50K with instructions £5. G. Smith Brynlwyd Capelseion Aberystwyth.

SIX (5K) ZX81 PROGS. With hints and tips bargain £4. D. O. S., 47 Reesfold Road, Luton Beds

SPECTRUM MUSIC. Printer listings for 10 classic tunes. Only £1 + sae. Gary Hynes Jasmine Cottage Chapel Lane Maidford Northants, NN12 8HQ

PROGRAMMERS WORKSHEETS. Sample pack £1.10 plus state basic or machine code (and machine) s.a.e. for the Business Services (C2) 16 Grosvenor West, Baldock, Herts. SG7 6NZ.

VIC20 SOFTWARE. Hang-man, requires additional 3K Ram. User defined graphics an excellent and written program on tape, only £4 inc. 6 Fund 10 Gladstone Court, Anson Road NW2 4LA.

ZX81, 32K, many software tapes, etc, £110. Nesbitt, phone 01 242 6644 day or 979 4258 evenings

MUNCHMAN, RACETRACK, CONNECT 4 Puzzle Mastermind cassette £ for standard Vic20 excellent sound and colour hi-res graphic, £5. I. Ingham 89 Dunsmuir Grove Gateshead Tyne and Wear

THE POOLS PROGRAM for ZX81 (16K). Three different forecasting methods used menu driven on cassette and full instructions £5.95. 72 Mullard Drive Whitnash Leamington Spa

Pegasus

A new game for Vic20 by Robert Herrold

You are a prostetnic vogon, Jeltz, captain of a vogon constructor ship. Your mission is to construct a galactic hyperspace bypass.

Fellow Confederation members the Pegasuses, a species of sentient winged horses, are in imminent danger of destruction. Their sun is about to go nova, which will destroy their ndme planet Laiteri and the rest of their solar system.

But, aware of the danger the Confederation has bahoed together to try and save the Pegasuses from their fate. An armada of hyperdrive transports has been rushed to Laiteri. The entire population is ready to be evacuated to Heliconia, an uninhabited world in the outer arm of the spiral nebular.

However, there is a problem. Laiteri is close to the galactic core which is packed with other solar systems, asteroids and dwarf stars. Any attempt to use hyperdrive would be fatal. Consequently, you have been detailed to clear a path out of the core.

The Confederation Council has assigned you a sector of the galaxy that is devoid of sentient life. But, you must be on the look out for the teasers.

This program runs on an unexpanded Vic20. Instructions for the control of your vogon constructor ship are included in the body of the program.

Lines 0-20 call the game instructions and initalise some of the display variables. Lines 20-47 generate a random field of 20 planets while lines 52-58 govern the vogon craft control sequence.

The subroutine at line 1000 pokes the vogon ship to the latest screen position. Lines 5000-6000 generate the flashing teaser. The end of game sequence is generated by the subroutine at line 11000.





```
2 POKE36879,4
4 PRINT"PEGASUS
6 PRINT"F3 TO CONTINUE
8 GETA$:IFA$=""THEN8
10 ST=INT(RND(1)*10)+5:GOSUB8000
14 XB=7944:GG=0:SI=0:TI$="000000"
16 PRINT"":POKE36875,0
20 FORM=1TO20
25 A=INT(RND(1)*396)
27 Y=INT(RND(1)*7)+1
29 IFPEEK(7680+A)=81THEN25
30 POKE7680+A,81
35 POKE7680+30720+A,Y
40 NEXTM
42 X1=7725+RND(1)*5
43 IFPEEK(X1)=81THENGOTO42
47 GOSUB1000
51 PRINT"TIME ";RIGHT$(TI$,3):PRINT"QUOTA";GI;" OF";ST
52 GETA$
53 IFA$="A"THENX2=-22:GOTO60
54 IFA$="Z"THENX2=22:GOTO60
55 IFA$=" "THENX2=-1:GOTO60
56 IFA$=" "THENX2=1
58 IFA$<>""THEN52
59 IFTI$>"000500"THEN11010
60 X1=X1+X2
61 IFX1<7725ORX1>8184THENGOSUB4000
62 IFPEEK(X1+1)=81ORPEEK(X1-1)=81THENGOSUB2000
65 GOSUB1000
67 IFPP=0THENHP=(RND(1)*21)+7724
69 IFPP=1THEN75
70 IFRND(1)<0.05THENPP=1
75 IFPP=1THENGOTO5000
90 IFRND(1)<.05THENGOSUB9010
95 IFX1=7725THENGOSUB11000
100 IFPEEK(X1+2)=102ORPEEK(X1)=102ORPEEK(X1-2)=102THENQQ=1
110 IFQQ=1THENGOSUB10000
120 IFQQ=0THENGOTO200
130 FORI=X1-2TOXB
135 POKEI,32:NEXTI
145 IFQQ=1THENXB=X1:3:QQ=0
150 IFXB>7944THENXB=7944
160 IFTI$>"000000"THEN300
200 GOTO51
300 END
1000 FORB=-1TO1STEP2
1002 POKEX1+B,X2,32:POKEX1+B,88:POKEX1+B+30720,1:NEXTB:RETURN
2000 POKE36878,0:POKE36876,220
2004 FORI=1TO100:NEXTI
2006 POKE36876,0:GI=GI+1:RETURN
4000 IFX1<7725ANDX2=-22THENX1=X1+22:GOSUB1000:A$="Z":GOTO54
4002 IFX1>8184ANDX2=22THENX1=X1-22:GOSUB1000:A$="A":GOTO53
4004 IFX1<7725ANDX2=-1THENX1=X1+1:GOSUB1000:A$=" ":GOTO56
4006 IFX1>8184ANDX2=1THENX1=X1-1:GOSUB1000:A$=" ":GOTO55
5005 POKEHP,90
5020 POKEHP+30720,2
5025 FORI=1TO15:NEXTI
5040 POKEHP+30720,7
5041 FORI=1TO15:NEXTI
5050 IFPEEK(HP+23)=102ORPEEK(HP+22)=102ORPEEK(HP)=102THENGOSUB10000
5055 IFPEEK(HP+23)=86ORPEEK(HP+22)=86ORPEEK(HP)=86THENGOTO6000
5060 IFPEEK(HP+23)=81ORPEEK(HP)=81THENGOSUB8000
5062 IFPEEK(HP+1)=86ORPEEK(HP)=86THENGOSUB10000
5065 POKEHP,32
5070 HP=HP+23
5075 IFHP>8164THENPP=0
5080 GOTO60
6000 POKE36878,10:FORM=100TO250STEP2
6001 POKE36876,M
6008 FORN=1TO5:NEXTN,M
6012 POKE36876,0
6014 FORM=1TO50:NEXTM
6020 POKE36876,0:POKEHP,32:PP=0:GOTO51
7000 POKE36877,220:FORL=15TO0STEP-2:POKE36878,L
7015 FORM=1TO150:NEXTM,L:POKE36877,0:POKE36878,0
7055 POKEHP,32:POKEX1,32:PP=0:GOTO70
8000 PRINT"
8005 PRINT"            KON JELTZ CAPTAIN
8010 PRINT"                 FOR THE PEGASUSES
     ON THEIR WAY TO HELICONIA"
8015 PRINT"                          TEE
     YOUR            THE PLANETS
8020 PRINT"
8025 PRINT"     -DOWN  "   RIGHT"
8030 PRINT"   TO CONTINUE
8035 GETA$:IFA$=""THEN8035
8040 PRINT"
8045 PRINT"  WELL AS CLEARING THE AREA LOOK OUT FOR THE TERRORS!"
8047 PRINT"DURING THE GAME YOU MUST DESTROY
     AT LEAST          PLANETS
8050 PRINT"            CONTINUE"
8060 GETA$:IFA$=""THEN8060
8065 RETURN
9010 IFPEEK(XB+2)=81THENGOTO9500
9015 POKEXB+1,102:POKEXB+1+30720,3:XB=XB+1:RETURN
9500 POKE36874,220:POKE36878,10
9700 FORI=1TO500:NEXTI
9795 POKE36874,0:POKE36878,0:RETURN
10000 POKE36877,220
10005 FORL=15TO0STEP-2.5:POKE36878,L:FORM=1TO200:NEXTM,L
10020 POKE36877,0:POKE36878,0
10035 IFQQ=1THENRETURN
10040 FORI=HP+22TOXB+1
10045 POKEI,32:NEXTI:XB=HP+21:POKEHP,32:GOTO5065
11000 FORI=1TO200:NEXTI
11005 PRINT"":POKE36879,42
11010 PRINT"GALACTIC HYPERSPACE  PLANNING COUNCIL"
11015 PRINT"HYPERSPACE BYPASS COMPLETED
11016 IFGI>=STTHEN11030
11018 PRINT"NOT MEETING YOUR PLANET QUOTA THE
     PEGASUS HAVE JUST BEEN"
11030 PRINT"FED TO THE "BRAINED BUGBLATTER BEAST OF TRAAL
11040 GOTO300
```



Programming

Play safe with crash barriers!

***David Lawrence** explains how to write programs that are idiot proof.*

'Idiot proofing' refers to the practice of refining an interactive program in such a way that it is capable of dealing with nonsensical inputs without crashing or producing equally nonsensical responses. There is, of course, no such thing as a perfectly idiot-proofed program. If you think your program is infallible, then you simply have not run up against a creative enough idiot yet.

The majority of invalid inputs arise from two causes: either the user has become blasé and, rather than playing close attention to the prompts supplied, is responding mistakenly to the prompt he *thinks* is next, or the user is unknowingly inputting nonsense, eg hitting the wrong key inadvertently.

The best check on such errors is simply to remind the user of the input that has been made and supply an opportunity to change that input before it is finally accepted. Listing (1) shows a typical subroutine designed to achieve this.

This subroutine can handle all of the program's prompts, printing each of them to a different part of the screen if desired and clearing the prompt and the input lines after use. In order to call the subroutine, three lines are required in the program, eg

```
1000 LET P$="INPUT NUMBER OF FISH"
1010 LET P=3
1020 GOSUB 5000
```

These three lines will cause 'INPUT NUMBER OF FISH' to be printed at line three. Once the response has been input, the user is given two displays of the answer and can confirm it by pressing *Newline*.

Once the respones is confirmed, the subroutine returns Q$ to the main program as the correct response to the prompt contained in P$. Numerical inputs can be dealt with by taking the *Val* of Q$ when it is returned.

But this subroutine will not deal with errors caused by the user misunderstanding what the program is asking for. Faced with the prompt "WHAT IS THE MONTH?" the user may understandably put '8'. But if the program expected the name of the month to be spelt out in full, it will stop.

To cope with such mistakes, the program must be able to recognise inputs which might result in a crash or a meaningless result. A common check is to examine numerical inputs to ensure they do not contain any non-numerical characters. Listing (2) is an example of a subroutine designed to achieve such a check working on the Q$ returned by listing (1).

Please note that if the input is rejected the user is told exactly why. There is nothing more confusing than a program which simply refuses to accept what the user thinks is the right response — if the input is unacceptable, say why!

Listing (3) gives the necessary lines to operate listings (1) and (2) together for numerical inputs. Having obtained a valid numerical input it is sometimes possible to check whether the value of the input falls within the range the program was designed to accommodate, as in listing (4).

Finally, after all these precautions have been taken, the program will crash at the moment calculated to cause the maximum inconvenience and irritation. Since this will happen, it is wise to program on principles that will minimise the damage.

Take the example of a filing program designed to store a large number of entries, each of which is made up of five numbers. Having input 99 entries, the program crashes on the fifth number of the hundredth entry.

The extent of the disaster depends upon what has been done with the four numbers that were accepted. If they have already been added to the main file then you are in trouble, since the structure of the file is now corrupted and it may be very difficult to sort out. The right course with any set of interdependent inputs is to store each temporarily and use them only when the program has successfully accepted all of them.

LISTING (1)

```
5000 REM ************************
5010 REM PROMPTS AND RESPONSES
5020 REM ************************
5030 REM O$ IS AN EMPTY ARRAY 32
CHARACTERS LONG
5040 PRINT AT P,0;O$
5050 PRINT AT P,0;P$,
5060 INPUT Q$
5070 PRINT O$
5080 PRINT AT 20,0;O$,O$
5090 PRINT AT 20,0;">>";Q$;"<<"
5100 PRINT AT 21,0;"NEWLINE TO C
ONFIRM"
5110 INPUT R$
5120 PRINT AT 20,0;O$,O$
5130 IF R$="" THEN GOTO 5150
5140 GOTO 5040
5160 RETURN
```

LISTING (3)

```
1000 LET P$="HOW MANY FISH?"
1010 LET P=3
1020 GOSUB 5000
1030 GOSUB 6000
1040 IF Q$="ZZZ" THEN GOTO 1000
```

LISTING (2)

```
6000 REM ************************
6010 REM CHECK NUMERIC INPUTS
6020 REM ************************
6030 IF LEN Q$=0 THEN GOTO 6080
6040 FOR I=1 TO LEN Q$
6050 IF CODE Q$(I)<27 OR CODE Q$
(I)>37 THEN GOTO 6080
6060 NEXT I
6070 GOTO 1010
6080 PRINT AT 20,0,"UNACCEPTABLE
.",,"PLEASE INPUT NUMBERS ONLY."
6090 FOR J=1 TO 50
6100 NEXT J
6110 PRINT AT 20,0,O$,O$
6120 LET Q$="ZZZ"
6130 GOTO 1010
```

LISTING (4)

```
1050 IF VAL Q$>=1 AND VAL Q$<=12
 THEN GOTO 1110
1060 PRINT AT 20,0,"NUMBER SHOUL
D BE IN RANGE 1-12"
1070 FOR I=1 TO 60
1080 NEXT I
1090 PRINT AT 20,0,O$
1100 GOTO 1000
```

The men who put Maplin on the map

***David Kelly** talks to Roger Allen, a co-founder of Maplin Electronic Supplies.*

For almost ten years Maplin has been supplying a huge range of electronic components to DIY enthusiasts

The mail-order company has recently branched out into micros and now produces a selection of electronic kits for the ZX81 It also sells the full range of Atari home computers and software and offers a broad selection of micro books

The company was started in 1972 by Doug Simmons and Roger and Sandra Allen Now situated in a sizable warehouse unit just outside Benfleet in Essex Maplin has grown considerably in the last 10 years

"At first, like most other small businesses we ran the thing from home said Roger 'Both Doug and I worked during the day Doug was employed by the GPO and I worked for the local paper so Sandra had to take the orders to the post office during the day

"I suppose we were never the cheapest supplier, but what we offered was quality components by return of post We only stocked manufacturer s guaranteed items All the orders were — and still are — sent out on the day they are received"

They moved into their first business premises in 1973 Now three moves later they have a mail-order company with 150 000 customers three shops and their own quarterly magazine

The Maplin Electronics Magazine contains projects and circuit diagrams of designs that can be built up using kits sold by Maplin

In a corner of the warehouse there are two rooms In one the development team invent new projects In the other there is a department that sorts out problems encountered by enthusiasts assembling the kits

If after telephone tuition they still cannot get the project to work the partly constructed kit can be returned to Maplin for repair An electronic organ kit had just been returned after being struck by lightning

But it is only comparatively recently that they have become involved in microcomputers

"About five or six years ago explained Roger we did the National SCAMP kit but in no time it was out of date We held on then and it is only recently that we have committed ourselves to selling a complete system

"Two years ago we were trying everything that was available We eventually chose the Atari system because the more we discovered about the machine the more we discovered it could do We sell both the 400 and 800 machines and we still have not stopped learning about them They have been on the market for nearly two years now and are still in our opinion, in front of the competition

"They now have the GTIA chip incorporated into them which is completely dedicated to screen formatting, leaving the CPU free and there is now a massive library of software available for it. We are just about to add a further 70 titles to the 80 we already offer '

Maplin have also produced a full-size moving keyboard kit for the ZX81 The design features shift-lock, function and graphics keys — alleviating the need to press more than one key at a time Over 15,000 of these kits have been dispatched in the three months it has been on sale

Maplin have also added a ZX81 16-line input/output port kit and over 75 computing books to their range

The company receives more than 1000 orders per day and is continuing to expand It opens its third retail shop in Birmingham in mid-August The mini computer system used for order processing is soon to be expanded to have a 1Mbyte core store

The ZX81 keyboard will soon be available in a ready-assembled form Maplin also plans to produce its own Atari software through its subsidiary, Mapsoft



Doug Simmons (sitting) and Roger Allen offering quality components by return of post.

What's happening

Bangor and Gwynedd Area computer club is soon to be set up Those interested in receiving more information should contact Dilwyn Jones, Fodol Farm, Hafod Lane Caernarfon Road Bangor Gwynedd

Vic Question Club is being set up to answer problems and give advice to Vic owners The club will also provide free programs and software tips for its members Contact A Shadi, 67 Worcester Street Wernam, Oldham, Lancashire

Southampton Spectrum Users who want to get together to exchange programs and ideas should contact Tom Selby 16 Candlemans Place, Westwood Road, Southampton (Tel 0703 552830)

Reviews
software

Allen Intruder

Carnell Software, 4 Staunton Road Slough Berkshire SL2 1NT
ZX81 16K cassettes
Price £5 each + 50p p & p.

Alien Intruder is based loosely on the film *Alien*. You are on board an Explorer-type spacecraft. A bloodthirsty alien is hunting for you after massacring the rest of the crew. As you stumble around the different levels of the spacecraft, looking for the escape shuttle, you will find various weapons to help you fight the monster, along with objects needed for your voyage after escaping.

The alien is suitably frightening when it finally confronts you and, as in the film, is immortal. You can only scare it away temporarily — it will keep coming back to terrorise you!

On side 2 of this tape is *Hieroglyphics*. This is very similar to Carnell's *Hangman* program, which was the support for *Volcanic Dungeon* on the previous tape.

Here, the player is presented with several graphic symbols, and then given a list of words, with the graphic symbols replacing the letters. As the code is broken, the letters may be inserted beneath the symbols to be used in decoding successive words. The hangman element is replaced in this version by a graphic representation of Wullie Makeit, the famous Scottish archaeologist, being slowly buried alive.

With each wrong guess a block of sand inches along a gangplank, to finally fall on poor Wullie's head, eliciting suitable comment from the poor man. In *Hangman* the victim's last words were, 'Snap ... aargh' — here they are 'Och, that sand's rough ... gurgle'. Very amusing, and draws forth shrieks of delight from the kids.

Wumpus Adventure is Carnell's version of the old favourite, and the least successful of the three tapes. The player is set loose in a system of caves in the hunt for Wumpuses (Wumpi?) and is provided with weapons to kill the dreaded monsters (can anyone tell me what they are?)

My main criticism is that the player is not given enough information about the location of these deadly hazards. One wrong guess and you are dead, with no opportunity for combat. However, a challenging game — for one or more players.

On the reverse side of the tape is *Movie Mogul*, an hilarious role-playing game. You are cast as a Big-Time Film Producer, and are given a budget with which to make a film. Natural and fiscal disasters occur regularly during filming. That the film gets finished at all is a miracle, but then one has to try and make a profit from the released film.

Both the latest additions to Carnell's range include a loading program at the start of each tape. It is 75 seconds long and will enable you to set the volume of your tape machine before loading the main program.

Summary
A varied mix from Carnell, all featuring imaginative responses and graphics, and all of them good games for all ages (*Heiroglyphics* is particularly good for children). I shall eagerly await Carnell's forthcoming 64K adventure, *Black Crystal*, which will be available for both the ZX81 and Spectrum. **TB**

Drawing Board

Cadsoft, 24 St James Street, Cheltenham Gloucestershire
ZX81, 16K, cassette
Price £4.00

Beneath the nausea-inducing yellow-green of the cassette art-work lies a tape which will become an essential aid for the programmer.

There are many programs available today which enable the ZX user to draw pictures with his computer. The better ones allow the user to *Save* his creations on tape for future viewing. Drawing-Board offers far, far more.

On loading, a grid appears (the program did not *Auto-run*, as promised), and a flashing pixel can then be moved with the cursor keys, drawing a black line as it goes. Using the grid, one can plan pictures in advance.

There are many commands available to the user, most of them on the named keys. Thus *Plot* (ie draw) is executed with the "Q" key, while *Unplot* (ie erase) is executed with the "W" key. While erasing, one is effectively "drawing" with a white line, and a command is available to render the whole screen in black in order to check the erasing process.

As well as the basic black pixel, you are able to use any of the letters, numbers and graphics characters available on the ZX81's keyboard. Certain combinations or strings of characters can also be repeated around the screen.

Now the program gets really interesting. Up to six pictures may be held in a store and recalled at anytime. In addition, two pictures can be merged. As far as I know this is a unique feature, and an extremely useful one.

One picture is termed the foreground picture, and the other the background picture. The foreground may be moved up, down and sideways until in the correct position against the background, and the resulting composite placed in the store. In this way a picture may be built up from many smaller ones.

All these pictures may be copied to a printer, or *Saved* for future use.

Probably the most powerful command in this program is the "place in *Print* statement" routine. As it says, this command will place up to five of the stored pictures into *Print* statements in your own program. Having struggled myself for hours trying to construct graphics in *Basic*, this, I am sure, will be a boon to many programmers.

Summary
Detailed and thoughtful instructions that leave nothing to chance, together with the information displayed on screen throughout, make this program easy to use. **TB**

Vicpendium

Opus 2 Software, 525/531 London Road, Westcliff-on-Sea, Essex
Vic20 cassette
Price £7.95

Vicpendium 1 is a cassette on which there are four games — Gorgon's Tomb, Invaders, Othello and Digitman, a combination of Mastermind and Hangman.

Gorgon's Tomb is no more than another version of a maze program. You have 30 seconds to memorise the maze before it disappears from the screen. You must then try and find the hidden treasure, picking up talismen as you go. Not a very exciting game.

Invaders, the program which Opus 2 calls "the original game", was far too slow. Missiles fired by the player and the aliens passed through each other without cancelling each other out.

Othello was a poor version of the game. The program was slow to respond and included a silly rule concerning invalid moves.

Digitman produced the greatest amusement, because there were few, if any, error traps.

Summary
A poor set of programs that are over priced. To have no defined graphics in a space invaders type of game, only oval blobs, makes one suspicious of the value of the other programs. **BA**

Video Inverter

D Fritsch 6 Stanton Road, Thelwall, Warrington, Cheshire WA4 2HS
Price kit £4 ready built and attached to a ZX81 £7 50

This is one development for the ZX81 which most people will welcome It inverts the normally black writing on white background into white writing on a black background This is easier on the eyes and is also what most computers use

But, unlike most inverters, this device has an added bonus The inverter module actually sharpens the appearance of the picture on both normal and inverse modes This gives a very crisp display

The inverter is easy to fit, if you are willing to use a soldering iron and the instructions are a model of clarity Even a template for marking out the hole to fit the switch at the back has been provided

There are only four connections to make The printed circuit board is one inch long and is stuck to the top of the ULA by a sticky pad The switch on the back is essential as it is difficult to see the *Saving* and *Loading* stripes in inverse video

If you would like the inverter but do not want to delve into the machine the company will do all the work for you

Summary
This is the first video inverter that I have found that also amplifies the video signal This is because the design is based on a transistor array instead of the more usual TTL logic gates The unit is simple and easy to fit and I would recommend it to anyone without hesitation **SA**

BBC Programming

Published by Interface 44-46 Earls Court Road, London W8 6EJ
By Tim Hartnell
Price £6 45

"Another great book from Interface Publications screams the back cover "This book by best-selling author Tim Hartnell is the ideal companion for you if the BBC Microcomputer is your first"

These claims are too generous I would not have found this book too helpful had it been my first glimpse of computing

Tim Hartnell's books are usually a collection of useful programs and they have normally arrived on the market so early that they are eagerly snapped up In this BBC book, *Let Your BBC Micro Teach You To Program* he has obviously determined to go a bit further by trying to give it the structure of a manual

The first section dives straight in with the *Print* statement, closely followed by a short introduction to the *Editing* commands



Fuller's high quality sound unit

Page by page he then runs through most of the BBC Micro's Basic statements and commands. Most of the sections are accompanied by one or two illustrative programs

Many of the listings offered very early in the book make use of some of the more advanced commands which are not explained until nearer the end of the book. For example, on page 18 he presents a listing for a game of Squash which is supposed to illustrate the use of the *Tab* statement. Unfortunately, the listing includes the use of Modes, variables string variables, procedures, Repeat Until, *FX If Then Sound, Vdu and others none of which are explained until later As the introduction to the program says "This listing may look pretty horrifying at the moment Once you have finished the book you will be surprised how much you can decipher"

The author of course recognised the limitations of his approach and refers the reader back to the BBC manual at several points in the text

Summary
BBC Basic is too complex to be explained in detail in a 200-page book The breathlessness of the explanations given are more likely to confuse than clear the mind of a beginner

The book is, however well produced and all the programs have been reproduced direct from original printouts It could therefore serve as a useful and interesting collection of 40 programs The explanations of all the Basic commands could also offer an interesting alternative explanation but only once the BBC manual has been read and mastered **DS**

Fuller Sound Box

Fuller Micro Systems The ZX Centre Sweeting Street, Liverpool 2 (Tel 051-236 6109)
Price £5 95

The sound on the Spectrum is not exactly brilliant Inside there is only a small crystal speaker activated by the *Beep* command The Fuller sound box offers you an alternative speaker with higher quality reproduction and some volume control

Those of you who have now received your Spectrums and have tested sound and music programs will know that the internal loudspeaker is not loud enough for any general use There are however several ways round its limitations

The sound signal is also transmitted through both the ear and mic sockets on the back of the Spectrum It is not normally possible on cheap cassette recorders to play a signal directly through the recorder's own speaker You can, however, record your sound on tape and then play it back

This is not very useful for those games which need the sound to accompany the program — such as a very loud game of Space Invaders But, if you have a more sophisticated recorder a hi-fi system or a music centre then you will be able to play the sound directly through the speaker(s)

The advantages of the sound box are that it is small convenient and relatively cheap It is well constructed in a standard black plastic box 118mm × 78mm × 35mm Across the top is a multi-coloured strip of paper to remind you that it is for the Spectrum On the front there is a knob for the volume control The holes to allow the sound to escape from the internal speaker have been drilled underneath the box which is supported by four rubber feet.

The box draws its power from the Spectrum's power pack. The lead from the power pack plugs into one side of the box An identical lead from the other side is then plugged into the Spectrum There is one further socket into which you plug either the ear or mic lead from the Spectrum This is for the sound signal

There is a small circuit board inside the box to translate the signal from the Spectrum, and a cheap but quite adequate loudspeaker

Summary
The Fuller sound box is a convenient and simple way of getting round some of the limitations of the Spectrum's sound facilities **DS**



THE DATA BASE

48K CASSETTE SYSTEM

Open Forum

Open Forum is for you to publish your programs and ideas. It is important that your programs are bug free before you send them in. We cannot test all of them. Contributions should be sent to: Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2H 7HF.

How to contribute

Each week the editor goes through all the programs that you send to Open Forum in order to find the Program of the Week.

The author of that program will qualify for DOUBLE the usual fee we pay for published programs (The usual fee is £10.)

Presentation hints

Programs which are most likely to be considered for the Program of the Week will be computer printed and accompanied by a cassette.

The program will be well documented, the documentation being typed with a double spacing between each line.

The documentation should start with a general description of the program and then give some detail of how the program has been constructed and of its special features.

Listings taken from a ZX Printer should be cut into convenient lengths and carefully stuck down on to white paper, avoiding any creasing.

Please enclose a stamped, self-addressed envelope

Smashout

on Spectrum

This program runs on a 16k Spectrum. It is a version of the arcade game Breakout. Every brick destroyed is worth 10 points. An extra ball is given if you reach 900 points. This is achieved by clearing one sheet.

The program makes use of the sound and colour of the ZX Spectrum. Instructions are contained in the program to tell you which keys move up and down.

Program Notes

Lines

5 Sets up a random border and sets the paper to blue

60-90 Sets up the playing area

100 Checks for obstacle in ball's way. If it is a brick then 10 is added to the score, makes a noise and rebounds ball

110-130 If balls hit border then rebounds ball and makes a noise

600 If ball hits bat then rebounds ball

605 If sheet is cleared then plays tone and sets up extra ball and resets playing area.

Smashout
by John Reynolds

```
   1 REM SMASHOUT
   2 CLS : GO TO 5000
   5 LET r=INT (RND*6)+1: BORDER
r: PAPER 1
  10 LET b=1
  20 LET a=2
  30 LET c=1
  40 LET d=1
  50 LET p=8
  60 LET o=p
  62 LET s=0: LET f=7
  63 LET e=1
  65 INK 4: PRINT "████████████
███████████████"
  66 FOR y=1 TO 15: PRINT TAB 3;
"█": NEXT y
  67 PRINT "█████████████████
█████████"
  70 FOR y=1 TO 15: INK (INT (RN
D*6)+2): PRINT AT y,20;"#": PRIN
T AT y,21;"#": PRINT AT y,22;"#"
: NEXT y
  80 FOR y=1 TO 15: INK (INT (RN
D*6)+2): PRINT AT y,27;"#": PRIN
T AT y,26;"#": PRINT AT y,28;"#"
: NEXT y
  90 PRINT AT 19,3;"Score
Ball"
  94 INK 7: PRINT AT 20,5;s;AT 2
0,18;e
  95 GO TO 200
 100 IF SCREEN$ (a,b)="#" THEN L
ET d=-d: BEEP .01,2: LET s=s+10
 102 PRINT AT a,b;"O"
 104 LET k=a: LET j=b
 105 LET a=a+c
 110 IF a>=15 OR a<=1 THEN LET c
=-c: BEEP .01,1
 125 LET b=b+d
 130 IF b>=30 OR b=1 THEN LET d=
-d: BEEP .01,2
 140 IF b=1 THEN GO SUB 600
 150 PRINT AT k,j;" "
 160 IF INKEY$="6" AND p<13 THEN
 LET p=p+1: GO TO 200
 170 IF INKEY$="7" AND p>1 THEN
LET p=p-1: GO TO 200
 180 GO TO 100
 200 PRINT AT o,1;" ": PRINT AT
o+1,1;" ": PRINT AT o+2,1;" "
 205 PRINT AT p,1;"█"
 210 PRINT AT p+1,1;"█"
 220 PRINT AT p+2,1;"█"
 230 LET o=p
 300 GO TO 100
 600 IF p=a OR p+1=a OR p+2=a TH
EN RETURN
 603 PRINT AT k,j;" "
 605 IF s=900 THEN CLS : LET f=f
+1: FOR v=1 TO 30: BEEP .1,INT (
RND*60): NEXT v: GO TO 65
 607 LET a=INT (RND*3)+2
 610 LET e=e+1: IF e>=f THEN GO
TO 900
 620 PRINT AT 20,5;s;AT 20,18;e
```

Lunar Lander

on BBC Micro

This program will run on either the Model A or B BBC microcomputer.

Can you land the Lunar Module on the moon without crashing it? To play the game you select your thrust (1-8) of the rockets on your Lunar Module. Z, X and C are your controls. Z is left, C is right and X is vertical thrust.

The program was actually written on a model B and uses mode 0 in line 15. To run the program on a model A change line 15 to mode 4. You have to sacrifice colour but you get a higher screen resolution.

Program notes

Lines

10-26 set up the screen and game variables
30-79 read and plot the landscape
80-110 set up the array to check for a good landing
120-170 plot over the old landing ship
180-230 print a new landing ship
240-280 check to see if the landing ship has crashed
290-400 read in control information from the keyboard and change the fuel, thrust and vertical speed
410-430 check to see if the landing ship has left the screen limits
440-520 print out your landing information and then goes back to line 120
520-600 check for a good landing or a crash landing
610-700 make explosions if you have crashed

Good luck. A successful landing needs a vertical velocity of less than 2 and horizontal velocity of 0 and, of course, a landing pad underneath.

Machine code

on Vic20

Most of the small micros around (BBC and Atom excepted) are totally *Basic* oriented. This is hardly surprising as the idea is to encourage beginners. This leads to problems though, when machine code is used with *Basic*. Where can it be stored so that no corruption or overwriting occurs?

The Vic comes with 3.5K as standard, but this can be expanded with 3K, 8K and 16K to give a maximum usable of 28K with 3K lying spare. This 3K becomes free (from *Basic*) when more than 3K expansion memory is added, so the problem only occurs with 3.5K or 6.5K Vics.

The Sinclair method of *Pokeing* machine code after *Rem* statements can be used, but it is a very tricky operation as no 0 value bytes must be used. If they are used the *Basic* will treat them as end-of-line markers and act very strangely with a very high probability of losing the program when reloaded after saving.

What seems to be the safest way is to trick *Basic* into thinking it has less *Ram* and then using the *Ram* this leaves free.

On both 3.5K and 6.5K Vics the top of memory is at address 7680. This value is held in locations 55 and 56 (enter *Print*

```
 650 PRINT AT 21,0,"Press Break
for next ball": IF INKEY$<>" " T
HEN GO TO 650
 660 PRINT AT 21,0,"
                 ": GO TO 100
 900 PRINT AT 10,4,"GAME OVER":
BEEP .3,INT (RND*12): IF INKEY$=
"r" THEN GO TO 925
 905 PRINT AT 20,5,s,AT 20,15,e
 910 PRINT  AT 10,4,"GAME OVER":
 BEEP .5,INT (RND*12): GO TO 900
 925 RUN
8000 BRIGHT 1: PRINT TAB 9,"SMAS
HOUT",TAB 9, INK 3,"********"
8010 PRINT AT 3,8,"By J.Reynolds
"
8050 PRINT
9000 BRIGHT 0: INK 7: PAPER 1: B
ORDER 2
9005 PRINT TAB 9,"Instructions"
 PRINT TAB 9,"____________"
9010 PRINT : PRINT "  To control
 the bat use the      following K
EYS:"
9020 PRINT : PRINT "6 moves the
BAT down": PRINT : PRINT "7 move
s the BAT up"
9030 PRINT : PRINT "  Bonus play
er at 900"
9035 PRINT : PRINT "Press R for
a new game"
9037 FOR e=1 TO 40: IF INKEY$<>"
" THEN BEEP .1,INT (RND*40): NE
XT e
9040 PRINT AT 21,0,"Press any ke
y to start": IF INKEY$<>"" THEN
GO TO 9050
9045 GO TO 9040
9050 CLS : GO TO 5
```

Lunar Lander
by Ben Randall

```
10CLS
15MODE0
17VDU19,3,2,0,0,0:VDU19,2,1,0,0,0
20HS=5:VS=0:X=100:Y=900:FU=300:MX=100:MY=900:
  DI$="V":TH=0:DIML(6):TIME=0
26 FU=1300
30FOR A=25 TO 1250 STEP 25
40READ P:PLOT5,A,P*15
50NEXT A
55 DATA 5,10,10,15,21,27,21,15,16,18,21,23,23,29,23,18
60DATA 15,10,5,3,2,2,3,6,12,6,13,17,20,20,25,30,22,22,14
70DATA 9,6,8,6,4,8,8,4,5,6,10,15,21,24,30
80FOR A=1 TO 6
90READ L(A)
100NEXT A
110DATA 50,300,525,725,825,1025
120REM PLOT OVER OLD SHIP
130PLOT 71,MX,MY
140PLOT 7,MX+5,MY+15
150PLOT 7,MX+10,MY
160PLOT 7,MX+5,MY+5
170PLOT 7,MX,MY
180REM PLOT NEW SHIP
190PLOT 69,X,Y
200PLOT 5,X+5,Y+15
210PLOT 5,X+10,Y
```

To next page

Peek(55)+ 256***Peek*(56) to see this) This value can be changed by a *Poke*

```
POKE 56 28
CLR
PRINT FRE(0)
```

This will show that your memory (for *Basic* programs) has dropped by 512 bytes. The value in 55 and 56 will now be 7168.

You can now *Poke* values into locations 7168 up to 7679 (not 7680).

It is a fairly simple task to save character sets and/or machine code on to tape just like a *Basic* program, so that they can be reloaded and not need to be *Poked* into memory. A program which used special characters can save a lot of memory by having the character set on tape before the program. This saves a lot of memory which is now not needed for the *Data* statements.

Here is how to save an area of memory from address A to address B. Before doing the following ensure that the area has been protected as in the first part of this article.

Enter the following lines at the keyboard directly without putting in line numbers.

```
N$ = "CHARSET"
L = LEN (N$)
POKE 183,L
FOR I = 1 TO L:POKE 672 +I,ASC
(MID$(N$,I)):NEXT
POKE 187,161:POKE 188,2
POKE 193,0:POKE 194,28
POKE 174,0:POKE 175,30
POKE 185,1:POKE 186,1
SYS 63190
```

At this point your Vic will say the usual 'Press record and play on tape' and when you do this your character set or whatever will be saved on cassette. It can be reloaded by the usual *Load* command but make sure you enter *New* afterwards because the end of program pointers will go funny and give weird values when you print *Fre(0)*. Typing in *New* will not lose your character set, but after loading, enter the *Pokes* needed to protect, before running any more programs. You can load *Basic* programs so long as they are not too big.

The above pokes can be altered for your own programs as follows:

LOCATION	WHAT IT DOES
183	Length of file name
187-188	Two byte address of file name
673-767	An area of memory that is totally free (used in the example above for the file name)
193-194	Address of start of memory to be saved
174-175	Address of end of memory to be saved
185	Must be 1 (Changed by LOADS etc.)
186	Must be 1

Note that 174 and 175 must point to the end of memory +1, or else you will lose the last byte of your saved memory. The values I used above (0,28) for 193 and 194, and (0,30) for 174 and 175 will save memory from 7168 to 7680.

```
220 PLOT 5,X+5,Y+5
230PLOT 5,X,Y
240REM CHECK GROUND BELOW AND SIDES
250FOR A=1 TO10
260P=POINT(X+A,Y-5):PL=POINT(X-5,Y+A):PR=POINT(X+15,Y+A)
270IF P<>0 OR PL<>0 OR PR<>0 THEN 530
280NEXT A
290G$=INKEY$(1)
300MX=X:MY=Y
310IF G$="Z"THEN DI$="L"
320 IF G$="X"THEN DI$="V"
330IF G$="C"THEN DI$="R"
350 IF VAL(G$)>0 AND VAL(G$)<9 THEN TH=VAL(G$)/2
355 IF G$="0" THEN TH=0
360FU=FU-TH:IF FU<0 THEN FU=0:TH=0
370VS=VS+3:IF DI$="V" THEN VS=VS-TH
380 IF VS>15 THEN VS=15
390IF DI$="R"THEN HS=HS+TH
395 IF DI$="L" THEN HS=HS-TH
400X=X+HS:Y=Y-VS
410REM SCREEN LIMITS
420IF X<10 OR X>1257 THEN X=MX
430IF Y>1000 THEN Y=MY
440REM INFORMATION
450PRINTTAB(22,2);"TIME:";INT(TIME/100)
460PRINTTAB(22,3);"V.VELOCITY:";VS;"      "
470 PRINTTAB(22,4);"H.VELOCITY(";:IF HS>0 THEN PRINT">";
475 IF HS<0 THEN PRINT"<";
480PRINT"):";ABS(HS);"       "
490PRINTTAB(22,5);"HEIGHT:";Y;"m";"       "
500PRINTTAB(22,6);"FUEL LEFT:";FU;"     "
510PRINTTAB(22,7);"THRUST:";TH;"     "
520GOTO 120
530REM
535 N=0
536 IF VS>2 THEN 640
540FOR B=1 TO 6
550IF X>L(B)AND X<L(B)+15 THEN N=10
560NEXT B
565 IF N=10THEN 570 ELSE640
570PRINTTAB(13,16);"A GOOD LANDING"
580J=INKEY(10200)
590MODE 4
600 END
610MX=100:X=100:MY=900:Y=900
620FU=FU+100
630RESTORE:GOTO  30
635 SOUND 0,-15,254,20
640 SOUND 0,-15,254,40
641FOR C=1 TO 20
650U=RND(200):V=RND(200)
660PLOT69,X+5,Y+5
670PLOT 5,(X+95)-U,(Y+105)-V
680NEXT C
690X=INKEY(1000)
700MODE 4:END
```

Chss And I

on ZX81

This program takes about one hour to enter but is good fun and worth the effort

Start by entering lines 100-110 and 400-420 Then as each line of the picture is added it can be checked by running the program to ensure that it builds up correctly

Readers may create animation effects by making the lips move and/or printing speech on lines 20 and 21, which have been left clear

The heads can be printed separately by changing line 410 as follows
PRINT A$(L TO16) or
PRINT A$(L, 17 TO)

To make the picture rise from the bottom of the screen, add this line
405 SCROLL

Hi-Res Sketcher

on Vic20

This program allows the use of hi-resolution graphics on the unexpanded Commodore Vic20 It uses the Vic's in-built facility for hi-res graphics and provides a resolution of 64 by 176 The program can be controlled using either the keyboard or a joystick

The program works by bit mapping the screen This involves giving every pixel on the screen its own bit in memory To be map the whole screen takes just over 4K of memory so only part of the screen is used and the Vic registers are used to centre the display to an 8 by 22 screen instead of a 23 by 22 screen

The instructions are contained in the program A breakdown of the main parts of the program is given below

Line 10 moves down the start of the screen
Line 20 this lowers the top of the memory to protect the hi-res area in the memory
Line 35 gives a repeat key function
Line 40 this changes the character memory pointer to the Ram
Line 50 clears the hi-res screen
Lines 70-90 fill the screen with characters for the hi-res to work on
Line 100 horizontal and vertical position of dot
Lines 110-230 get the direction from the keyboard or joystick.
Lines 240-260 calculate the bit needed using the following routine

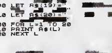
```
Character=Int(X/8)*8*Int(Y/8)
Row=(Y/8-Int(Y/8))*8
Byte=7168+Character*8+Row
Bit=7-(X-(Int(X/8)*8))
Poke Byte Peek(Byte) or (2 ↑ Bit)
```

Subroutine 1000 sets up joystick variables

To next page

Chas And I
by Diane Cox

```
100 REM CHAS AND I
110 DIM A$(20,32)
120 LET A$(1)="
130 LET A$(2)="
140 LET A$(3)="
150 LET A$(4)="
160 LET A$(5)="
170 LET A$(6)="
180 LET A$(7)="
190 LET A$(8)="
200 LET A$(9)="
210 LET A$(10)="
220 LET A$(11)="
230 LET A$(12)="
240 LET A$(13)="
250 LET A$(14)="
260 LET A$(15)="
270 LET A$(16)="
280 LET A$(17)="
290 LET A$(18)="
300 LET A$(19)="
310 LET A$(20)="
400 FOR L=1 TO 20
410 PRINT A$(L)
420 NEXT L
```









Subroutine 2000 prints out the instructions

Subroutine 3000 returns the Vic back to normal

Variables used in the program are as follows



X—horizontal position of dot.
Y—vertical position of dot.
I—For/next loops.
DD—Data direction registers for joysticks (37154)
PA—Joystick register A (37137)
PB—Joystick register B (37152)
L—Joystick input.
D—Keyboard input.
CH—Character of dot.
RO—Row of dot.
BY—Byte of dot.
BI—Bit of dot.
JS—Joystick array

Hi-Res Sketcher
by Simon Parker

```
0 REM**HI-RES SKETCHEP***BY SIMON FARKER****4 1952****.
5 GOSUB2000
10 POKE36865,60
20 POKE52,24 POKE56,24 CLR
30 GOSUB1000
35 POKE650,255
40 POKE36869,254 POKE36866,PEEK(36866)OR128 POKE36867,144
50 FORI=6144TO7679 POKEI,0 NEXT
60 POKE36879,143 PRINTCHR$(147)
70 FORI=0TO21 FORM=0TO22
80 POKE7680+M*22+1,I*8+M
90 NEXT NEXT
100 X=164 Y=32
110 POKEDD,127 S3=-((PEEK(PB)AND128)=0) POKEDD,255
120 F=PEEK(PA) S1=-((FAND8)=0) S2=((FAND16)=0) S0=((PAND4)=0)
130 FR=-(PAND32)=0) A=S2+S3 B=S0+S1
140 L=JS(A+1,B+1)
145 GETA$ D=VAL(A$) IFA$="E"THEN3000
150 IFL=2ORD=6THENX=X+1 GOTO240
160 IFL=0ORD=8THENY=Y-1 GOTO240
170 IFL=4ORD=2THENY=Y+1 GOTO240
100 IFL=6ORD=4THENX=X-1 GOTO240
130 IFL=1ORD=9THENY=Y-1 X=X+1 GOTO240
200 IFL=3ORD=3THENY=Y+1 X=X+1 GOTO240
210 IFL=5ORD=1THENY=Y+1 X=X-1 GOTO240
220 IFL=7ORD=7THENY=Y-1 X=X-1 GOTO240
230 IFFR=1ORD=5THEN50
240 CH=INT(X/8)*6+INT(Y/8)
250 RO=(Y/6-INT(Y/8))*8
260 BY=6144+CH*8+RO
270 BI=7-(X-(INT(X/8)*8))
200 POKEBY,PEEK(BY)OR(2↑BI)
290 GOTO110
1000 DIMJS(2,2) POKE37139,0 DD=37154 PA=37137 PB=37152
1010 FORI=0TO2 FORJ=0TO2 READJS(J,I) NEXTJ,I
1020 DATA7,0,1,6,8,2,5,4,3
1030 RETURN
2000 PRINT"]***HI-RES SKETCHER***"
2010 PRINT"■THIS PROGRAM ENABLES YOU TO DRAW ON THE SCREEN USING THE KEY'
2020 PRINT"BOARD OR JOYSTICKS    WITH A RESOLUTION OF  64 BY 176."
2030 PRINT"THE KEY-BOARD CONTROLSARE AS FOLLOWS -"
2040 PRINT"■     7 8 9                   \|/"
2050 PRINT"     4-●-6"
2060 PRINT"      /|\                   1 2 3"
2070 PRINT"■'5'-CLEARS THE SCREEN AS DOES THE 'FIRE'    BUTTON."
2075 PRINT"'E'RETURNS TO NORMAL"
2080 PRINT"■HIT ANY KEY TO START■"
2090 GETA$ IFA$=""THEN2090
2100 RETURN
3000 POKE36879,27 POKE36867,46 POKE36865,38 POKE36869,240
3010 POKE198,0 PRINT"]" END/ 3020 PRINT"]"
```

Scene

on Spectrum

This program will demonstrate how good the new Sinclair micro's hi-resolution colour graphics really are.

When *Run* it starts by drawing the sky and ground and then plots a light snowfall on the ground. Then it proceeds to draw a road and rainbow in perspective.

Finally, after an approximate pause of 10 seconds, night falls on the scene and the moon and randomly twinkling stars place themselves in front of the eyes of the viewer. Then the scene turns to daytime and the program starts again.

Program notes

Lines 80-89 define the character for the moon.

Line 110: In between the quotes are 32 spaces.

Line 135 is the number of snowflakes to be plotted. The variable "N" can be adjusted for more or less density.

Lines 180-210 draw the road and line 185 misses the three lines to represent the line down the middle of the road.

Line 350 sets the colours of the rainbow.

Line 490 resets the colours of the rainbow in the data in line 350.

Line 9999 resets the colours of the screen to a readable white paper and black ink. This should be obtained by a *Goto* statement followed by 9999 after pressing *Break* to stop the program.

PROGRAM OF THE WEEK

Scene
by Tim Whittaker

```
  10 REM     "scene"
  20 REM  by T.M.Whittaker
  30 REM    © T.M.W-1982
  40 REM
  50 REM character
      initialisation
  60 FOR r=0 TO 7
  65 READ a  POKE USR CHR$ (144)
+r,a
  70 NEXT r
  80 DATA BIN 00001100,BIN 00011
000,BIN 00110000,BIN 01110000,BI
N 01110000,BIN 00110000,BIN 0001
1000,BIN 00001100
  90 REM SKY AND GROUND
 100 PAPER 5   BORDER 1  CLS
 105 FOR n=11 TO 21
 110 PRINT PAPER 4,AT n,0,"
 120 NEXT n
 130 REM snow
 135 FOR n=1 TO 600  REM
approximately 1/2 a minute
 136 BRIGHT 1  INK 7
 140 LET y=RND*66  LET x=RND*254
 150 PLOT INK 7,x,y  NEXT n
 160 REM road
 170 INK 0  PAPER 7
 175 LET x=-70
 180 FOR n=165 TO 255
 185 IF n=230 OR n=231 OR n=229
THEN GO TO 210
 190 PLOT n,0
 200 DRAW x,66
 205 LET x=x-1
 210 NEXT n
 250 REM rainbow
 260 LET a=90  LET r=40
 270 FOR m=1 TO 5
 280 READ c  INK c
 290 FOR n=1 TO 10
 300 PLOT a,68  DRAW r,0,-PI
 310 LET a=a-1  LET r=r+2
 320 NEXT n
 330 NEXT m
 350 DATA 2,6,4,1,3
 400 REM Night
 410 PAUSE 500
 430 FOR n=0 TO 10  PRINT PAPER
0,AT n,0,"
        ",  NEXT n
 440 FOR n=1 TO 75
 460 PLOT INK 6,RND*254,(RND*70)
+104  NEXT n
 460 PRINT PAPER 0, INK 6,AT 4,6
;"A"  REM GRAPHIC "A"
 464 FOR m=1 TO 300
 470 PLOT INK 6,(RND*190)+60,(RN
D*70)+104
 475 INK 0  PLOT (RND*190)+60,(R
ND*70)+104
 480 NEXT m
 490 RESTORE 350
 500 FOR n=0 TO 10  PRINT PAPER
5,AT n,0,"
        "  NEXT n
 510 GO TO 260
9999 PAPER 7  INK 0
```

Sound & vision



Name that tune on your Vic

This routine enables the user to write play and save musical compositions on a Vic20 The program occupies 3 2K and will therefore only run on expanded Vics

On running, the program asks for the length of composition On a Vic with 3K expansion the maximum tune size is roughly 55 notes The program is menu driven and has the following commands

a) *Key in tune*

The user is asked to enter the composition note by note Each voice (1, 2 and 3) can be programmed and they carry the following octaves

Voice 1 C1 to G3 (2 octaves)
Voice 2 C3 to B6 (2 octaves)
Voice 3 C5 to C6 (1 octave)

The note name is entered followed by its octave, eg, D2 Sharpened notes are entered in a similar way eg C#4 Flattened notes are entered as the corresponding sharp eg A3 flat = G#2 If the voice is to be silent then input S

This is repeated for each voice giving a one two or three voice note Once the voices have been defined the 'value of the note is input Five values are allowed and the note can be dotted giving a further five values A rest can be played by inputting S for all three voices

The user can leave this mode at any time by inputting "Q This gives the opportunity to test the tune The mode can be re-entered using *Continue tune*

b) *Tempo change*

This command sets the duration of the longest note All other notes are played at the correct speed relative to this base rate The input value is a simple integer, eg 500 2100

c) *Play tune*

This plays the tune at the required tempo The number of each note is displayed in the top left hand corner as the note is played

d) *Single step*

This command plays the tune note by note The 'S' key is pressed to step through the tune Again, the note number is displayed This instruction enables the user to locate incorrect notes

e) *Alter note*

This allows the alteration of specific notes in the tune

f) *Continue tune*

This resumes the keying in phase after the last note written

g) *Record to tape & Load tune*

Saves and loads the tune on cassette

h) *New tune*

Resets for a new composition

Alan Webb

```
10 INPUT"MAX. NO. OF NOTES",MN
20 DIM NT$(3,MN),NV(3,MN),ND(MN),NN$(3,24),VN(3,24),ND$(MN)
30 DATAC1,135,C#1,143,D1,147,D#1,151,E1,159,F1,163,F#1,167,G1,175,G#1,179,A2,10
3
40 DATAA#2,107,B2,191,C2,195,C#2,199,D2,201,D#2,203,E2,207,F2,209,F#2,212,G2,21
5
50 DATAG#2,217,A3,219,A#3,221,B3,223
60 FORL=1TO24
70 READ NN$(1,L),VN(1,L) NEXT
80 DATAC3,195,C#3,199,D3,201,D#3,203,E3,207,F3,209,F#3,212,G3,215,G#3,217,A4,21
9
90 DATAA#4,221,B4,223,C4,225,C#4,227,D4,228,D#4,229,E4,231,F4,232,F#4,233,G4,23
5
100 DATAG#4,236,A5,237,A#5,238,B5,239
110 FORL=1TO24
120 READ NN$(2,L),VN(2,L) NEXT
130 DATAC5,225,C#5,227,D5,228,D#5,229,E5,231,F5,232,F#5,233,G5,235,G#5,236,A6,2
37

140 DATAA#6,238,B6,239,C6,240
150 FORL=1TO13
160 READ NN$(3,L),VN(3,L) NEXT
170 DATASB,1,MI,.5,CR,.25,QU,.125,SQ,.0625
180 FORL=1TO5
190 READTY$(L),DU(L) NEXT
200 PRINT"MUSIC COMPOSER"
210 PRINT"A. WEBB 1982"
220 PRINT"______________________"
230 PRINT"1. ALTER NOTE"
240 PRINT"2. CONTINUE TUNE"
250 PRINT"3. KEY IN TUNE"
260 PRINT"4. LOAD TUNE"
270 PRINT"5. NEW TUNE"
280 PRINT"6. PLAY TUNE"
290 PRINT"7. RECORD TO TAPE"
300 PRINT"8. SINGLE STEP"
310 PRINT"9. TEMPO CHANGE"
320 GETI$ IFI$=""THEN320
330 IFI$="L"THEN1300
340 IFI$="K"THEN420
350 IFI$="T"THEN660
360 IFI$="P"THEN680
370 IFI$="N"THENRUN
380 IFI$="C"THEN420
390 IFI$="S"THEN800
400 IFI$="A"THEN960
410 IFI$="R"THEN1190
420 CO=CO+1
```

Sound & vision

```
430 PRINT"■NOTE",CO PRINT"■■INPUT 'Q' TO
    QUIT■" FORL=1TO3
440 PRINT"VOICE",L, INPUTNT$(L,CO)
450 IFNT$(L,CO)="Q"THENCO=CO-1 GOTO200
460 IFNT$(L,CO)="S"THENNV(L,CO)=0 GOTO520
470 J=1
480 IFNT$(L,CO)=NN$(L,J)THEN510
490 J=J+1 IFJ<=24THEN480
500 PRINT"NOT ON THIS VOICE" GOTO440
510 NV(L,CO)=VN(L,J)
520 NEXT
530 PRINT"■■■■■EMI ■■EVE, ■MI■NIM"
540 PRINT"■■■■F■TCHET ■■U■■ER"
550 PRINT"■■■■■■■EMI ■■■AVER"
560 INPUT"■NOTE NAME",ND$(CO)
570 J=1
580 IFND$(CO)=TY$(J)THEN610
590 J=J+1 IFJ<=5THEN580
600 PRINT"NO SUCH NOTE" GOTO530
610 ND(CO)=DU(J)
620 INPUT"DOTTED",I$
630 IFI$="Y"THENND(CO)=ND(CO)*1.5
640 CO=CO+1 IFCO=MN+1THENCO=CO-1 GOTO200
650 GOTO430
660 INPUT"■TEMPO",TE
670 GOTO200
680 POKE36878,12 PRINT"■NOTE" FORL=1TOCO
690 PRINT"■"TAB(5)L POKE36874,NV(1,L)
700 POKE36875,NV(2,L)
710 POKE36876,NV(3,L)
720 FORJ=1TOTE*ND(L) NEXT
730 NEXT
740 POKE36874,0
750 POKE36875,0
760 POKE36876,0
770 POKE36878,0
780 GOTO200
800 POKE36878,12 PRINT"■NOTE" L=1
810 PRINT"■"TAB(5)L
820 GETI$ IFI$=""THEN820
830 IFI$="S"THEN860
840 IFI$="Q"GOTO200
850 GOTO820
860 POKE36874,NV(1,L)
870 POKE36875,NV(2,L)
880 POKE36876,NV(3,L)
890 FORJ=1TOTE*ND(L) NEXT
900 POKE36874,0
910 POKE36875,0
920 POKE36876,0
930 L=L+1 IFL<CO+1THEN810
940 POKE36878,0
950 GOTO200
960 INPUT"■NUMBER OF NOTE",NU
970 PRINT"■CHANGE NOTE",NU PRINT"■■INPUT
    'Q' TO QUIT■" FORL=1TO3
980 PRINT"VOICE",L, INPUTNT$(L,NU)
990 IFNT$(L,NU)="Q"THEN200
1000 IFNT$(L,NU)="S"THENNV(L,NU)=0 GOTO1060
1010 J=1
1020 IFNT$(L,NU)=NN$(L,J)THEN1050
1030 J=J+1 IFJ<=24THEN1020
1040 PRINT"NOT ON THIS VOICE" GOTO980
1050 NV(L,NU)=VN(L,J)
1060 NEXT
1070 PRINT"■■■■■EMI ■■EVE ■MI■NIM"
1080 PRINT"■■■■F■TCHET ■■U■■ER"
1090 PRINT"■■■■■■■EMI ■■UAVER"
1100 INPUT"■NOTE NAME",ND$(NU)
1110 J=1
1120 IFND$(NU)=TY$(J)THEN1150
1130 J=J+1 IFJ<=5THEN1120
1140 PRINT"NO SUCH NOTE" GOTO1070
1150 ND(NU)=DU(J)
1160 INPUT"DOTTED",I$
1170 IFI$="Y"THENND(NU)=ND(NU)*1.5
1180 GOTO200
1190 PRINT"■INPUT FILENAME"
1200 INPUTFI$
1210 PRINT"■ PUT IN CASSETTE AND"
1220 PRINT"■      PRESS SPACE"
1225 GETII$ IFII$<>" "THEN1225
1230 OPEN1,1,1,FI$
1240 PRINT#1,CO PRINT#1,TE
1250 FORL=1TOCO
1260 FORK=1TO3
1270 PRINT#1,NV(K,L) NEXT
1280 PRINT#1,ND(L) NEXT
1290 CLOSE1 GOTO200
1300 PRINT"■INPUT FILENAME"
1310 INPUTFI$
1320 PRINT"■ PUT IN CASSETTE AND"
1330 PRINT"■      PRESS SPACE"
1335 GETII$ IFII$<>" "THEN1335
1340 OPEN1,1,0,FI$
1350 INPUT#1,CO INPUT#1,TE
1360 FORL=1TOCO
1370 FORK=1TO3
1380 INPUT#1,NV(K,L) NEXT
1390 INPUT#1,ND(L) NEXT
1400 CLOSE1 GOTO200
READY.
```

Learning to clock the right answer

Roger Swift introduces a program to learn multiplication tables

I wrote this program so that my children could practise their times tables. It started as a standard program which allowed any amount of tima for tha answer to be entered.

But I once found my daughter was using a calculator to work out the answers and build up anormous scores. This program stops that sort of cheating by introducing a tima element. If you answer the question correctly insibe one second you score 10. For each second of delay tha score for a correct answer drops by one.

Right answer

After 10 seconds, the program assumes you do not know the right answer and tells you what it is (after a short, rude noise). You get a percentage score after 10 questions and an invitation to try again. I have yet to score 100 percent.

The score is represented by s while c is the question count. Lines 130 to 180 print a rectangle of dots to illustrate tha question. Line 1030 sets tha time interval for the count down. Once you press the first digit of your answer you have a masimum of one second batween subsequent digits (lines 1070 + 1120).

```
  10 REM "fastables"
  20 LET s=0
  22 LET c=0
  25 INPUT "Please enter your na
me.",n$
  30 CLS
  32 LET c=c+1
  35 LET x=INT (RND*11+2): LET y
=INT (RND*11+2)
  40 PRINT AT 7,22;"score =",s
  50 PRINT AT 5,22;n$,"'s"
 100 PRINT AT 0,x/2;x
 110 PRINT AT y/2,x+1;y
 120 PRINT AT 1,0;
 130 FOR f=1 TO y
 140 PRINT
 150 FOR n=1 TO x
 160 PRINT "■";
 170 NEXT n
 180 NEXT f
 200 PRINT AT y+5,x/2;x;" X ";y;
" = ?"
 210 GO TO 1000
 230 REM wrong answer or too slo
w
 240 LET s=s-1
 245 IF s<0 THEN LET s=0
 250 PRINT AT 7,29;s
 255 BEEP .5,-40
 260 PRINT AT y+7,x/2;"No, ";x;"
 X ";y;" = "; FLASH 1;x*y
 265 PAUSE 300
 270 GO TO 350
 290 REM correct answer
 300 BEEP .5,30
 305 PRINT AT y+7,x/2;"Well done
"
 310 LET s=s+q
 320 PRINT AT 7,29; FLASH 1;s
 330 PAUSE 100
 340 REM finish after 10 questio
ns
 350 IF c=10 THEN GO TO 2000
 360 GO TO 30
1000 REM timing
1010 LET q=10
1020 PRINT AT 17,0;"Q score = ";
q;" "
1025 IF q=0 THEN GO TO 240
1030 PAUSE 50
1040 IF INKEY$="" THEN LET q=q-1
: GO TO 1020
1050 LET k=VAL INKEY$
1055 PRINT AT y+5,x/2+10;k;
1060 IF k=x*y THEN GO TO 300
1070 PAUSE 50
1080 IF INKEY$="" THEN GO TO 240
1090 LET l=VAL INKEY$: PRINT l;
1100 LET k=k*10+l
1110 IF k=x*y THEN GO TO 300
1120 PAUSE 50
1130 IF INKEY$="" THEN GO TO 240
1140 LET m=VAL INKEY$: PRINT m
1150 LET k=k*10+m
1160 IF k=x*y THEN GO TO 300
1170 GO TO 240
1999 REM finish
2000 PRINT AT 10,0; FLASH 1;n$;"
. you score ";s;"%."
2010 LET c=0: LET s=0
2020 INPUT "again?",s$
2030 IF s$(1)="y" THEN GO TO 30
2040 STOP
```

Bits 'n' pieces

Llamasoft offer a version of *Centipede* for the 16 or 48K Spectrum. The game is written by Jeff Minter.

For more details contact Llamasoft Software, Lindon House, The Green, Tadley, Basingstoke (tel 07356 5038).

Contribute!

You can share your own favourite Spectrum routines and programs with other readers by sending lists with explanations to us at *Popular Computing Weekly*.

WRITE TO Spectrum, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

Peek & poke

Peek your problems to our address. Ian Beardsmore will poke back an answer.

WATCH OUT I'M ON THE RAM-PAGE!

Dave Coomber of King Edwards Avenue, Leeds writes

Q **I have recently read that the ZX Spectrum needs 7K of Ram to drive the colour screen. Yet Sinclair say in their adverts that 16K is available to the user. Who is right?**

A Strictly speaking they both are. As the display on the screen changes, the screen locations have to be stored in the systems variables. On the ZX80 this took up just 40 bytes. On the ZX81 it rose to 125 and with the Spectrum it is nearly 7K bytes.

To be fair to Sinclair, they do make it clear that this is in fact the case. Their most common advertisement is the glossy handout which has a comparison chart. The third line of this chart reads Standard Ram available using high resolution Graphics — 9K

But, it is quite fair to say that 16K is available. It is just that you have to use 7K if you want good graphics

RAM RAM THANK-YOU MAM!

Andrew Hooley, Branmay Drive, Tottington, Bury, Lancashire, writes

Q **I own a ZX80 with 16K Ram and new 8K Rom. At Christmas I got the Comp Shop's *Slow* mode kit. It is very good, but even before I got it I had trouble with my ZX80 crashing. It continued to crash after Christmas, with the *Slow* mode fitted.**

In the end, I sent it back to Sinclair having banged it by accident. Two weeks later it came back and worked well for two minutes. Then it crashed again. This was without the *Slow* mode attached.

It kept on crashing until eventually I could not get the cursor back. So I sent it back to Sinclair again.

Two weeks later it came back with a letter saying that the warranty had run out and it would cost £200 if I wanted them to repair it. Can you tell me if I should pay the money, as the computer was not working properly when it was returned the first time?

A Unfortunately, if your ZX80 did not work when it was returned the first time, then you should have returned it immediately. By not doing so, you have in effect accepted that the work they have done on it was satisfactory

I can fully sympathise with you not wanting to send your computer back and be without it for yet more weeks. I mentioned the catch 22 of sending a computer back to Sinclair a few weeks ago. However, to be fair to them, the horror stories of six and eight weeks delays seem to have dried up in the last few months. They do seem to be a lot better now in returning things within a reasonable time

But, this still leaves you with a computer that does not work, and one which will cost you £20 to put right again. Before you part with your £20, there are a few simple checks that can be made to see if there is a simple solution to your problems. The two obvious things to check are the Ram pack and the power supply lead. How well does you computer work without the Ram pack fitted?

The ZX80 is also infamous for overheating. The heat sink is on the left as you look at the computer near the back. It is also therefore near the Ram pack. Too much heat will corrupt the Ram pack and cause a crash

The other thing to check is the power supply unit. Though this has not caused as many problems in the 80 as the 81, it is not by any means unknown for an 80 to crash because the power supply jack was loose in the socket. This is more likely to happen if the Ram pack is attached. Remember the Ram is volatile, and needs to be constantly topped up to maintain its contents. Even the slightest loss of power can cause trouble

If you find that overheating is the problem, then you must either keep something cold always on the left of the computer's 'hump' or try and dissipate the heat some other way. You can keep a supply of ice cubes in plastic containers on the computer, but this is cumbersome and dangerous. One drop of stray water can ruin your computer

By far the most common remedy is to drill holes or cut slots above the heat sink. Indeed, I do not know of a ZX80 still in use that does not have this, or a similar, modification. It does of course void your guarantee, but as yours has expired it does not matter.

If you want to drill holes in the case, take the top off the computer by pressing out the centres of the white studs. At the back, near the I/O port, you will see a piece of aluminium rising up off the pcb and bent towards the modulator. This is the heat sink. Drill holes in the case above it.

If you think that the power supply jack is the cause of the trouble then take the top off. Next, carefully press down the clips on the power supply socket so they grip better

If you do not think that either of these two things are the cause of your problem then do not try either modification. Instead, you must decide whether you think that your ZX80 is worth another £20. If you think it is, send it back again. When it returns check it throughly! If it still does not work, then send it back at once

I'M SORRY TO RAM-BLE ON . . .

Alan Errington of 79 Mayfields, Spennymore, Co Durham, writes

Q **I wrote a data processing program for the ZX81, with Audio Computers 32K Ram board. The program ran well until I decided to speed it up by adding *Fast* to some of the computing sections. This worked, too, and I *Saved* it, overwriting the original recording. Now the program *Loads* well enough but will not stop in the computer for more than four minutes even if I do not *Run* the program**

I suspect the trouble arises from the fact that I have used the *Pause* statement without *Poke* 16347,255 as suggested in the manual. The snag is that the program is about 10K long and I have not got time to make all the deletions before I lose the program. Can you help?

I have also started a computer club in Spennymore, that metes on Thursdays at six o'clock. I would be interested to hear from anyone in the area who has a computer, or is thinking of buying one.

A The command *Poke* 16437,255 puts the command *Copy* into the second address of *Frames*, the actual systems variable which controls the timing. Unfortunately, if you are in *Fast* then the lack of an instruction to *Copy* will just cause the computer to stop when the time runs out

I cannot think of a quick way round your problem, other than by editing out the *Fast* commands or by adding the necessary *Poke* commands. To buy yourself the necessary time to do this you might try adding

```
1 PAUSE 32766
2 POKE 16437,255
3 SLOW
```

This might be enough to keep the program in the memory for as long as you want it. However, I doubt it. What it should do though is to buy you nearly 11 minutes of time in which to *Edit* the remaining lines

I do not know how many *Fast* commands you have, or if you have an independent list of them. As it takes longer to enter the *Poke* command than to edit out a line, you ought find it best to *Edit* out all the *Fast* commands so that the program is again in *Slow*. Then you can add the *Fast* commands, followed by their *Pokes* at your leisure) I hope you have left space as your line numbering)

I wish you well with your club, and have included your full address so that anyone who wants to join it can contact you

Send your questions to Peek & poke, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

Competitions

Will it go round in circles?

by Gordon Lee

The circle is the most perfect of shapes. The mathematical constant, π, defined by the ratio of a circle's circumference to its diameter, occurs in many applications, some of which seem far removed from any circular connections.

Pi has a value of 3.1415926536 ..., which is an approximation to this 'irrational' number. By irrational we mean that the number cannot be expressed as a finite number of decimals.

In the last century, Shanks calculated π to over 600 decimal places. It has now been computed to over a million decimal places and no order or pattern of repetition has so far been detected in the digits.

In view of this it may seem surprising that the number can be evaluated as the sum of a simple series:

$\pi = 4 \times (1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} \ldots)$

This series lends itself to translation into a simple computer program to generate the stages of the series. If you do this, note how each term brings the value nearer π and how the values alternate each side of the expected value as they converge. That is why this type of series is known as 'convergent'.

Another way to calculate π was noticed by the 18th century mathematician, George Louis Leclerc. He saw that if a series of straight lines a distance a apart, are drawn on a flat surface and a needle of length l is dropped at random on to the surface, then the probability of the needle touching or crossing a line is $2l/a\pi$. If $a = l$ the expression reduces to $2/\pi$.

Try this for yourself but, be warned, to get a statistically acceptable result the 'drop' must be performed hundreds of times.

Puzzle No 18

Ever since the Jones' moved to Sycamore Avenue their movements have been carefully observed by the whole street. Their most recent venture has been a magnificent circular swimming pool — 25 feet in diameter. As the work proceeded, the Smiths next door plotted their response. They designed an enviable pool in the shape of two intersecting circles, as shown in the diagram.

?

18ft

The original plan was to have a much bigger pool than the Jones'. Unfortunately because of a bye-law which limits such things they discovered that there is a maximum allowable surface area for a pool — this area being that of the Jones' pool. If each of the circular sections has a diameter of 18 feet, how far apart should the centres be if the Smith's pool is to have an area as large as the bye-law permits?

The closing date for the competition is Tuesday September 7.

Solution to Puzzle No 15

The program works by squaring successive integers in the range 11112 to 31426 (the minimum and maximum numbers which have squares of nine digits).

The main difficulty in solving the problem is that we are handling nine-digit numbers and some computers only work with a maximum of eight numbers. This is overcome by evaluating the higher order of digits and the tens and units digits separately (Lines 20 to 60). Then by linking the strings together, these are combined into a single string (Line 80), where a check for the presence of zeros or the duplication of digits can be made.

```
10 FOR N = 11112 TO 31426
20 LET N$ = STR$ N
30 LET S$ = STR$ (N * N)
40 LET U$ = STR$ (VAL N$ (4 TO 5) * VAL N$
   (4 to 5))
50 IF LEN U$ = 1 THEN LET U$ = "0" + U$
60 LET U$ = U$ (LEN U$ - 1 TO LEN U$)
70 IF U$ (2) = "0" THEN GOTO 160
80 LET S$ = S$ (1 TO 7) + U$
90 FOR P = 1 TO 8
100 FOR Q = P + 1 TO 9
110 IF S$ (P) = "0" OR S$ (P) = (Q) THEN
    GOTO 160
120 NEXT Q
130 NEXT P
140 PRINT N, S$
150 STOP
160 NEXT N
```

This program finds the lowest value. To find the highest value Line 10 should be amended to

```
10 FOR N = 31426 TO 11112 STEP -1
```

These programs give the lowest and highest squares as 139854276 and 923187456 (11826^2 and 30384^2, respectively.

Winner of Puzzle No 15

The winner is Ray Reaves, Longford Avenue, Southall, Middlesex, who receives £10.

READ-OUT

READ-OUT FOR SOFTWARE & BOOKS

THE FIRST IN A NEW SERIES FOR FIRST TIME USERS

JUST AVAILABLE

Learning to Use the PET Computer by Garry Marshall is the first title in a new series of books which introduces newcomers to the most widely used micros in the marketplace

The book assumes absolutely no knowledge about computers and the reader is shown even the most fundamental operations such as "switching on" and "loading a program" The book leads the reader through simple programming and then on to graphics, with several programs which show how to achieve pictures and even animation!

The user friendly approach is consistent throughout the text – not only are program listings clearly shown but in many cases a photograph is included to show what the program looks like when actually loaded and run! £5 95 (incl postage) **Gower – A Read-Out Publication**

Other titles in the series due August/September 1982

Learning to Use the ZX Spectrum by Robin Bradbeer £5 95 (incl postage)

Learning to Use the BBC Microcomputer by P M Dane £5 95 (incl postage)

Learning to Use the VIC 20 by Ron Greere 5 95 (incl postage)

Learning to Use the ZX81 by Robin Bradbeer £5 95 (incl postage)

Reserve your copies today! Complete the order form below and your order will be reserved and sent you on publication



READ-OUT PUBLISHING COMPANY LTD
8 Camp Road, Farnborough, Hampshire, GU24 6EW Telephone: 0252 510331/2 Telex 858001 GOWER G

READ-OUT PUBLISHING COMPANY LTD

8 CAMP ROAD FARNBOROUGH HAMPSHIRE GU24 6EW
24 hour answering service Telephone 0252 510331 2

Name

Address

Make cheques payable to Read Out Publishing Company Ltd

I enclose my cheque for £

Please debit my Access

Number

Signed

Date

Please send me copy ies of
All prices include postage

- [ ] Learning to Use the PET Computer @ £5 95
- [ ] Learning to Use the ZX Spectrum @ £5 95
- [ ] Learning to Use the BBC Microcomputer £5 95
- [ ] Learning to Use the VIC 20 @ £5 95
- [ ] Learning to Use the ZX81 @ £5 95

PC 13